CLAIMS

I CLAIM:

1. A bleed valve for use in a gas turbine engine comprising:

a housing with an inlet and an outlet said housing being hollow with an inner and outer surface; said housing further defining an interior region and an exterior region;

a shaft guide fixed to the interior surface of said housing;

a shaft slidably mounted in said shaft guide;

a poppet attached to said shaft, said poppet having a seat to contact the interior surface of said housing;

a stationary piston positioned in the interior region of said housing, said stationary piston in contact with said poppet whereby said stationary piston and said poppet define a fluid chamber;

sealing rings located between said poppet and said stationary piston;

a biasing means positioned in the interior of said chamber; and

a fluid inlet providing fluid communication between said chamber and the exterior region of said housing.

2. The bleed valve of claim 1 wherein said sealing rings comprise carbon piston rings.

3. The bleed valve of claim 1 wherein said sealing ring provides a degree of contact sufficient to maintain a pressurized seal within said fluid chamber whereby fluid pressure admitted to chamber can move said poppet.

4. The bleed valve of claim 1 wherein said biasing means comprises a spring.

5. The bleed valve of claim 4 wherein said spring moves the bleed valve into an open position at atmospheric pressures.

6. The bleed valve of claim 1 wherein air pressure from a compressor stage with a pressure higher than the pressure of the compressor stage where the bleed valve is located provides the air for fluid inlet.

7. The bleed valve of claim 1 further comprising a stop whereby said poppet rests against said stop when said valve is in a fully open position.

8. The bleed valve of claim 1 wherein said stationary piston is affixed to said shaft guide.

9. The bleed valve of claim 1 further comprising a housing seat corresponding to said seat on said poppet whereby said housing seat and said poppet seat restrict airflow through said housing when said housing seat contacts said poppet seat.

10. The bleed valve of claim 1 further comprising at least one support element affixed to the interior surface of said housing and providing support for said shaft guide.

11. A bleed valve located at an intermediate compressor stage of a gas turbine engine for use to relieve compressor pressure in the engine wherein said bleed valve may move between an open and a closed position comprising:

a housing defining an interior and an exterior and having an inlet exposed to compressor air and an outlet exposed to fan air;

a shaft positioned within the interior of said housing;

a stationary piston;

a poppet moveably attached to said shaft, said poppet having a range of motion between an open and a closed position; said poppet having a face exposed to compressor air from said housing inlet;

a chamber defined by said poppet and said stationary piston; and

a spring that holds said poppet in an open position when the gas turbine engine is off but that permits said poppet to move to the closed position when said compressor provides pressurized air.

12. The bleed valve of claim 11 further comprising a poppet seat located on said poppet and a corresponding housing seat on said housing wherein said poppet

seat contacts said housing seat when the valve is in the closed position, thereby restricting air flow through said housing.

13. The bleed valve of claim 11 wherein compressor pressure at said housing inlet is less than the pressure in said chamber, when fluid pressure is provided to said chamber, whereby the pressure in said chamber moves said poppet from the closed to the open position.

14. The bleed valve of claim 11 wherein the fluid provided to said chamber through said fluid inlet is air taken from a compressor stage with pressure that is higher than the pressure at the compressor stage where said bleed valve is located.

15. The bleed valve of claim 11 wherein said shaft further comprises at least one flat for providing a slideable contact between said shaft and said shaft guide.

16. The bleed valve of claim 11 further comprising a stop affixed to said housing wherein said poppet contacts said stop when in the open position.

17. The bleed valve of claim 11 further comprising a shaft guide positioned within the interior of said housing wherein said shaft moves within said shaft guide.

18. The bleed valve of claim 17 further comprising a cap affixed to said shaft guide to provide a pressure seal within said shaft guide.

19. The bleed valve of claim 11 further comprising a wall defining a secondary chamber attached to said poppet; a vent providing fluid communication between said secondary chamber and the exterior of said housing, and a cylinder within which said secondary chamber moves.

20. The bleed valve of claim 19 further comprising a secondary sealing ring to provide a pressurized seal between said secondary chamber and cylinder.

21. The bleed valve of claim 19 further comprising at least one arm affixed to said housing wherein said vent is positioned within said arm.

22. The bleed valve of claim 19 further comprising a cap structure affixed to said housing said cap structure comprising said arm and cylinder.

23. A high pressure bleed valve for use in a gas turbine engine comprising:

a housing with an inlet and an outlet said housing being hollow with an inner and outer surface; said housing further defining an interior region and an exterior region;

a shaft guide fixed to the interior surface of said housing;

a shaft slidably mounted in said shaft guide;

a poppet attached to said shaft, said poppet having a seat to contact the interior surface of said housing;

a stationary piston positioned in the interior region of said housing, said stationary piston in contact with said poppet whereby said stationary piston and said poppet define a fluid chamber;

sealing rings located between said poppet and said stationary piston;

a biasing means positioned in the interior of said chamber; and

a fluid inlet providing fluid communication between said chamber and the exterior region of said housing;

a wall defining a secondary chamber positioned adjacent said poppet;

a vent providing fluid communication between said secondary chamber and the exterior of said housing, and

a cylinder within which said secondary chamber moves.

24. The bleed valve of claim 23 further comprising a secondary sealing ring to provide a pressurized seal between said secondary chamber and cylinder.

25. The bleed valve of claim 23 further comprising at least one arm affixed to said housing wherein said vent is positioned within said arm.

26. The bleed valve of claim 23 further comprising a cap structure affixed to said housing said cap structure comprising said arm and cylinder.

27. The bleed valve of claim 23 wherein the bleed valve is located at a compressor stage of the engine and the fluid pressure applied to said fluid inlet is taken from the compressor stage where the bleed valve is located.

28. The bleed valve of claim 23 wherein said vent is open to the fan air surrounding the compressor stage where the bleed valve is located.

29. The bleed valve of claim 23 wherein said cylinder further comprises a cylinder landing wherein said poppet contacts said cylinder landing.

30. A method for controlling pressure within a gas turbine compressor stage comprising the steps of:

moving a poppet into an open position such that air is free to flow through a housing body;

passing compressor air across said poppet thereby moving said poppet into a closed position;

admitting air pressure into a fluid chamber thereby moving said poppet into an open position;

passing compressor air through the body of said housing while said poppet is in the open position for a desired time; and

removing air pressure from a fluid chamber thereby allowing said poppet to return to a closed position.

31. The method of claim 30 wherein the step of moving a poppet into an open position is achieved by a spring located within said chamber.

32. The method of claim 30 wherein the air admitted to said chamber is at a pressure higher than the pressure of the compressor air admitted into the housing.

33. The method of claim 30 wherein the steps are performed in the order presented.

34. The method of claim 30 further comprising the step of venting air from a secondary chamber to a point outside the housing body.